

Listing of Claims

1. (Previously Presented) A transformed prokaryotic cell comprising:
an exogenous nucleic acid molecule encoding a beta-alanine/pyruvate aminotransferase having at least 95% sequence identity to SEQ ID NO: 20, wherein the beta-alanine/pyruvate aminotransferase is capable of producing malonate semialdehyde and alanine from beta-alanine and pyruvate, and
an exogenous nucleic acid molecule encoding an alanine 2,3-aminomutase, wherein the alanine 2,3-aminomutase is capable of producing beta-alanine from alpha-alanine, wherein the prokaryotic cell produces 3-hydroxypropionic acid (3-HP) from beta-alanine.
2. (Previously Presented) The transformed cell of claim 1, wherein the exogenous nucleic acid molecule encoding the beta-alanine/pyruvate aminotransferase comprises a sequence having at least 95% sequence identity to SEQ ID NO: 19.
3. (Previously Presented) The transformed cell of claim 1, wherein the exogenous nucleic acid molecule encoding the beta-alanine/pyruvate aminotransferase comprises SEQ ID NO: 19.
4. (cancelled)
5. (Original) The transformed cell of claim 1, wherein the cell further comprises dehydrogenase activity capable of converting malonate semialdehyde to 3-HP.
6. (Original) The transformed cell of claim 5, wherein the cell further comprises an exogenous nucleic acid molecule encoding a dehydrogenase capable of converting malonate semialdehyde to 3-HP.
7. (Original) The transformed cell of claim 6, wherein the dehydrogenase is a 3-hydroxypropionate dehydrogenase.

8. (Previously Presented) The transformed cell of claim 7, wherein the exogenous nucleic acid molecule encoding the 3-hydroxypropionate dehydrogenase comprises a sequence having at least 95% sequence identity to SEQ ID NO: 27.

9. (Original) The transformed cell of claim 8, wherein the exogenous nucleic acid molecule encoding the 3-hydroxypropionate dehydrogenase comprises SEQ ID NO: 27.

10. (Original) The transformed cell of claim 7, wherein the 3-hydroxypropionate dehydrogenase comprises SEQ ID NO: 28.

11. (Cancelled)

12. (cancelled)

13. (Previously Presented) The transformed cell of claim 1, wherein the exogenous nucleic acid molecule that encodes an alanine 2,3-aminomutase comprises a sequence having at least 95% sequence identity to SEQ ID NO: 25 and the alanine 2,3-aminomutase is capable of producing beta-alanine from alpha-alanine.

14. (Previously Presented) The transformed cell of claim 13, wherein the exogenous nucleic acid molecule that encodes an alanine 2,3-aminomutase comprises SEQ ID NO: 25.

15. (Previously Presented) The transformed cell of claim 1, wherein the alanine 2,3-aminomutase comprises SEQ ID NO: 26.

16. (cancelled)

17. (Previously Presented) The transformed cell of claim 1, wherein the prokaryotic cell is a *Lactobacillus*, *Lactococcus*, *Bacillus*, or *Escherichia* cell.

18. (cancelled)

19. (cancelled)

20. (Previously Presented) The transformed cell of claim 1, wherein the cell further comprises lipase or esterase activity, or a combination thereof.

21. (Original) The transformed cell of claim 20, wherein the cell further comprises an exogenous nucleic acid molecule encoding a lipase or an esterase.

22. (Previously Presented) The transformed cell of claim 1, wherein the cell further comprises:
3-hydroxypropionate dehydrogenase activity and lipase or esterase activity.

23. (Previously Presented) The transformed cell of claim 20, wherein the transformed cell produces an ester of 3-HP.

24. (Original) The cell of claim 23, wherein the ester of 3-HP is methyl 3-hydroxypropionate, ethyl 3-hydroxypropionate, propyl 3-hydroxypropionate, butyl 3-hydroxypropionate, or 2-ethylhexyl 3-hydroxypropionate.

25. (Previously Presented) The transformed cell of claim 1, wherein the cell further comprises aldehyde dehydrogenase activity and alcohol dehydrogenase activity.

26. (Original) The transformed cell of claim 25 wherein the cell further comprises an exogenous nucleic acid molecule encoding an aldehyde dehydrogenase and an exogenous nucleic acid molecule encoding an alcohol dehydrogenase.

27. (Previously Presented) The transformed cell of claim 1, wherein the cell further comprises:

3-hydroxypropionate dehydrogenase activity;
aldehyde dehydrogenase activity; and
alcohol dehydrogenase activity.

28. (Previously Presented) The transformed cell of claim 25, wherein the transformed cell produces 1,3-propanediol.

29. (Previously Presented) The transformed cell of claim 1, wherein the cell further comprises esterase activity.

30. (Original) The transformed cell of claim 29, wherein the cell further comprises an exogenous nucleic acid molecule encoding an esterase.

31. (Previously Presented) The transformed cell of claim 1, wherein the cell further comprises:

3-hydroxypropionate dehydrogenase activity; and
esterase activity.

32. (Previously Presented) The transformed cell of claim 29, wherein the transformed cell produces polymerized 3-HP.

33. (Previously Presented) A method for making 3-HP from beta-alanine, comprising culturing the transformed cell of claim 1 under conditions that allow the transformed cell to make 3-HP from beta-alanine.

34. (Cancelled)

35. (Previously Presented) The method of claim 33, wherein the cell is an *E. coli* cell.

36. (Previously Presented) A method of producing an ester of 3-HP, comprising culturing the transformed cell of claim 20 under conditions wherein the transformed cell produces an ester of 3-HP.

37. (Original) The method of claim 36, wherein the ester of 3-HP is methyl 3-hydroxypropionate, ethyl 3-hydroxypropionate, propyl 3-hydroxypropionate, butyl 3-hydroxypropionate, or 2-ethylhexyl 3-hydroxypropionate.

38. (Previously Presented) A method of producing 1,3 propanediol, comprising culturing the transformed cell of claim 25 under conditions wherein the transformed cell produces 1,3 propanediol.

39. (Previously Presented) A method of producing polymerized 3-HP, comprising culturing the transformed cell of claim 29 under conditions wherein the transformed cell produces polymerized 3-HP.

40. (Currently Amended) A method for making 3-HP, comprising:
culturing the transformed cell of claim [3]1 to allow the transformed cell to make 3-HP.

41. - 65. (cancelled)

66. (Previously Presented) The transformed cell of claim 1, wherein the alanine 2,3-aminomutase comprises at least 95% sequence identity to SEQ ID NO: 26 and is capable of producing beta-alanine from alpha-alanine.

67. (Previously Presented) The transformed cell of claim 1, wherein the cell does not express lactate dehydrogenase.

68. (Previously Presented) The transformed cell of claim 1, wherein the cell is an *E. coli* cell.

69. (Previously Presented) The transformed cell of claim 1, wherein the exogenous nucleic acid molecule encoding the beta-alanine/pyruvate aminotransferase comprises a sequence that can hybridize under highly stringent hybridization conditions to SEQ ID NO: 19, wherein the highly stringent hybridization conditions comprise incubation at about 42°C in a hybridization solution containing 25 mM KPO₄ (pH 7.4), 5X SSC, 5X Denhart's solution, 50 µg/mL denatured, sonicated salmon sperm DNA, 50% formamide, 10% dextran sulfate, and 1-15 ng/mL probe and washes are performed at about 65°C with a wash solution containing 0.2X SSC and 0.1% SDS.

70. (Previously Presented) The transformed cell of claim 1, wherein the exogenous nucleic acid molecule encoding the alanine 2,3-aminomutase comprises a sequence that can hybridize under highly stringent hybridization conditions to SEQ ID NO: 25, wherein the highly stringent hybridization conditions comprise incubation at about 42°C in a hybridization solution containing 25 mM KPO₄ (pH 7.4), 5X SSC, 5X Denhart's solution, 50 µg/mL denatured, sonicated salmon sperm DNA, 50% formamide, 10% dextran sulfate, and 1-15 ng/mL probe and washes are performed at about 65°C with a wash solution containing 0.2X SSC and 0.1% SDS.